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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,032	09/05/2003	John C. McCosh	PSI-05	8468

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EXAMINER

TERESINSKI, JOHN

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 11/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,032

Applicant(s)

MCCOSH, JOHN C.

Examiner

John Teresinski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 6, 9 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S.

Patent No. 6,285,195 to Needle.

Regarding claim 19, Needle discloses a time domain reflectometry apparatus and method including turning a duration signal to an “on”/enabled state (column 4 lines 45-50), waiting a known delay time after turning on the duration signal (column 3 lines 3-12), launching a launch signal on to a cable after the known delay time (column 4 lines 47-49), detecting a bounced/reflected signal (column 4 lines 49-50), transitioning the duration signal to “off”/stop using an adapted threshold (column 4 lines 49-50), measuring the duration that the duration signal was in the “on”/enabled state (column 4 lines 50-53), compensating the duration signal for the known delay time (column 3 lines 12-20), and calculating a cable length using the compensated duration signal (column 1 lines 31-33, column 3 lines 25-30).

Regarding claim 1, Needle discloses a launch controller periodically: generating a sync signal for transitioning a duration signal to an “on”/enabled state (column 4 lines 45-50); waiting a known delay time (column 3 lines 3-12); and generating a launch signal on a cable (column 4 lines 47-49);

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a detection circuit: detection circuit detecting that the launch signal has bounced back using an adapted threshold (column 4 lines 39-44); and transitioning responsive to detecting the bounced launch signal the duration signal to an “off” state (column 4 lines 49-50); an oscillator providing a clock signal that is unrelated to the timing of the launch signal (column 4 lines 45-50); a counter for counting the number of clock signals received while the duration signal is in the “on”/enabled state (column 4 lines 49-53); and

a controller: compensating for the additional clock signals received on account of the known delay time (column 3 lines 12-20); and calculating cable length (column 1 lines 31-33, column 3 lines 25-30).

Regarding claim 6, Needle discloses the oscillator is constructed to provide a clock signal slower than about 50 MHZ (column 4 lines 63-65).

Regarding claim 9, Needle discloses the counter is constructed to count the number of clock signals received in each one of multiple signal durations, and the controller performs the additional step of aggregating the count results for multiple counts (column lines 10-30).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 2-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Needle in view of U.S. Patent No. 4,970,466 to Bolles et al..

Regarding claim 2, Needle does not teach taking duration measurements at a plurality of voltage levels or determining a voltage level at an inflection point in the bounced/reflected launch signal. Bolles et al. disclose a time domain reflectometry apparatus including adjusting a threshold voltage to a plurality of voltage levels (column 13 lines 25-40), taking duration measurements at each voltage level (column 12 lines 13-15), aggregating the duration measurements and generating a set of measurements (column 13 lines 41-50), determining a voltage level at an inflection point in the bounced/reflected launch signal (column 13 lines 51-59) and using the determined voltage level as an adapted threshold level (column 13 lines 52-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include to include the teachings of Bolles et al. into Needle for the purpose of characterizing cable lengths which include faults.

Regarding claim 3, Needle discloses the set of measurements is used to determine an open or short condition (column 6 lines 1-6).

Regarding claims 4 and 5, Needle discloses the use of a counter but does not disclose an 8 bit-counter. Bolles et al. disclose an 8-bit counter (column 18 lines 7-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an 8 bit-counter as taught by Bolles et al. into Needle for the purpose of providing a counter suitable for TDR measurements.

Regarding claim 8, Needle disclose generating sync signals as disclosed above but fails to teach generating a sync signal about every 40 microseconds. Bolles et al. disclose the launch

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controller is constructed to generate a sync signal about every 40 microseconds (column 22 lines 30-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include generating a signal about every 40 microseconds as taught by Bolles et al. into Needle for the purpose of a frequency suitable for TDR analysis.

Claims 7 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Needle in view of U.S. Patent No. 5,440,528 to Walsh.

Regarding claims 7 and 10-12, Needle discloses providing a low frequency clock signal (column 4 lines 60-63) and an adapted threshold (column 5 lines 55-67), performing a measurement cycle which: starts a duration measurement (column 4 lines 45-49); provides a duration signal having a duration indicative of cable length, the duration signal being turned off responsive to comparing the adapted threshold to a bounced/reflected signal (column 4 lines 49-51); counting the number of clock pulses received during the duration that the duration signal is on (column 4 lines 50-54); and calculating a cable length (column 1 lines 31-33, column 3 lines 25-30). Needle fails to explicitly teach repeating the measurement cycle more than about a thousand times, averaging the results from the measurement cycle and calculating a cable length using the average results or a low frequency of about 10 MHZ.

Walsh discloses a time domain reflectometry apparatus and method including providing a low frequency clock signal at about 10 MHZ (column 3 lines 17-23), providing a duration signal having a duration indicative of cable length (column 4 lines 54-63), counting the number of clock pulses received during the duration that the duration signal is on a repeating the measurement cycle (column 4 lines 54-63), averaging the results from the measurement cycle

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more than about a thousand times (column 7 lines 7-12) and calculating a cable length using the average results (column 4 lines 54-58, column 7 lines 8-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include averaging results as taught by Walsh into Needle for the purpose of determining cable lengths with increased accuracy.

Regarding claim 13, Needle discloses counting a plurality of cycles (column 4 lines 49-53). Needle does not teach counting up to a maximum number of 255. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include counting up to a maximum number of 255, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Needle and Walsh as applied to claims 1-3 above and further in view of U.S. Patent No. 6,075,833 to Leshay et al..

Regarding claims 14 and 15, Bolles et al. disclose the device and method as described above including counting the number of clock pulses but does not teach a Gray code counter or two-bit Gray code counting. Leshay et al. disclose a Gray code counter for counting clock signal events (column 3 lines 1-2) and two bit Gray code counting (column 4 lines 3-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the Gray code counting method as taught by Leshay et al. into Bolles et al. for the purpose of providing a more robust counter.

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Needle and Walsh as applied to claims 1-3 above and further in view of U.S. Patent No. 4,970,466 to Bolles et al..

Regarding claims 16 and 17, Needle as modified does not teach taking duration measurements at a plurality of voltage levels or determining a voltage level at an inflection point in the bounced/reflected launch signal. Bolles et al. disclose a time domain reflectometry apparatus including adjusting a threshold voltage to a plurality of voltage levels (column 13 lines 25-40), taking duration measurements at each voltage level (column 12 lines 13-15), aggregating the duration measurements and generating a set of measurements (column 13 lines 41-50), determining a voltage level at an inflection point in the bounced/reflected launch signal (column 13 lines 51-59) and using the determined voltage level as an adapted threshold level (column 13 lines 52-57). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the teachings of Bolles et al. into Needle as modified for the purpose of characterizing cable lengths which include faults.

Regarding claim 18, Needle discloses the set of measurements is used to determine an open or short condition (column 6 lines 1-6).

Response to Arguments

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Teresinski whose telephone number is (571) 272-2235. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JT
JT

November 1, 2005

V. Nguyen
11/02/2005

VINCENT Q. NGUYEN
PRIMARY EXAMINER